Patent Claims

1. Ophthalmological examination and/or treatment station, characterized by a modular design comprising a lighting device (305), an observation device (325a/b, 326a/b, 315; 322, 323), an optical measuring system (312, 311, 309, 313) having at least one first optical fibre (309) and one first collimator (310b), with which radiation from this fibre (309) can be converted into a first free-space beam (312), an evaluation unit (317), and a patient module (303) which can be positioned directly in front of the patient's eye (301) and has at least one second fibre coupler part for a second optical fibre (304), with a corresponding coupler (302), for detachable connection to the locally remote lighting device (305), and at least one first fibre coupler part (311) for detachable coupling of the first fibre (309) of the measuring system to a corresponding coupler, and at least one second collimator (310a) with which the radiation from the at least one second fibre (304) can be converted into a second free-space beam (307), the collimators (310a/b) being arranged in the patient module (303), and the measuring system being connected in signal terms to the evaluation unit (317), which is likewise arranged remote from the patient module (303).

2. Examination and/or treatment station according to Claim 1, characterized by a display element (315) which is arranged on the patient module (303) and is connected to the evaluation unit (317) via a detachable electrical signal line (316).

3. Examination and/or treatment station according to Claim 1 or 2, characterized in that the observation device is designed with an eyepiece

(323) arranged in the patient module (303) and with an objective lens (322) for eye examination.

4. Examination and/or treatment station according to Claim 1 or 2, characterized in that the observation device has an image detecting element (CCD) (326a/b) and an optical unit (325a/b) which projects an area of the eye to be examined onto an image detecting element (326a/b), the image detecting element (326a/b) and optical unit (325a/b) being arranged in the patient module (303), and, in particular, image detecting element (326a/b) and optical unit (325a/b) are formed in a pair and at a distance from one another in order to permit stereoscopic observation.

5. Ophthalmological examination and/or treatment station according to one of Claims 1 to 4, characterized by a holding device for the patient module preferably designed as an aligning device for positioning in front of the patient's eye, and in particular by a geometric design of the patient module in the order of size of a contact lens in order to take up only a small area of space in front of the patient, the modular design being selected overall such that it takes up the space of just one apparatus but makes it possible to achieve the functionality of a number of different individual apparatus.

6. Ophthalmological examination and/or treatment station, characterized in that the measuring system and/or the observation device is connected to a preferably computer-assisted evaluation unit for the evaluation of measurement data, and the evaluation unit is connected, in particular via a data network, to other data memories containing retrievable data, in order to be able to process the determined and/or evaluated data using the

other data.

7. Measuring system, preferably as part of an ophthalmological examination and/or treatment station according to one of Claims 1 to 6, with an optical system, principally made up of fibre optics with a short-coherent radiation source (9; 73; 92; 149; 191a-e) and of the Michelson interferometer type, of which the measuring arm (7; 72; 91; 157b) has an optical fibre and a collimator with which radiation from this fibre can be converted into a free-space beam which can be directed onto a patient's eye as an optically transparent and/or diffusive reflecting object (1, 1', 1''; 147; 205), and of which the reference arm (5; 67; 86a, 86b; 157a) has a path length variation unit (39; 55; 61; 71; 89; 161v) for modifying the transit time, characterized in that at least two reflectors (31a, 31b; 49, 50; 57a, 57b; 69a, 69b; 87a, 87b; 161a-c; 161a-d) producing a transit time difference are present in the reference arm, and the fibre in the measuring arm is preferably designed such that it can be separated by means of a fibre coupler.

8. Measuring system according to Claim 7, characterized in that the reflectors (31a, 31b; 49, 50; 57a, 57b; 87a, 87b; 161a-c; 161a-d) are designed such that they reflect the radiation incident on them into themselves and are preferably offset at different depths and in particular are movable with one another in order preferably to generate the transit time modification and transit time difference together.

9. Measuring system according to Claim 7 or 8, characterized by an optical element (35; 61) in the reference arm (5), which element covers the reflectors (31a, 31b; 57a, 57b) in succession with

measurement beams.

10. Method for automatic measurement of optical properties of at least two spatially separate areas (2a, 2b; 97a, 97b; 177a-d, 181a-d) using a measuring system according to one of Claims 7 to 9 on a transparent and/or diffusive object (1, 1', 1''; 147; 205), in particular a patient's eye, at a measuring time in the subsecond range, the short-coherent radiation issuing from a radiation source (9; 73; 92; 149; 191a-e) being divided into a measurement beam and a reference beam, the measurement beam irradiating the areas (2a, 2b; 97a, 97b; 177a-d, 181a-d), and a transit time change being imposed on the reference beam, characterized in that the reference beam is reflected on at least two reflectors (31a, 31b; 49, 50; 57a, 57b; 69a, 69b; 87a, 87b; 161a-c; 161a-d) generating a transit time difference and the reflected reference beam is then combined interfering with the reflected measurement beam, and the combined beam is detected and the detected signal is evaluated for distance measurement.

11. Method according to Claim 10, characterized in that in order to generate both the transit time change and also the transit time difference, the reflectors (31a, 31b; 49, 50; 69a, 69b; 87a, 87b; 161a-c; 161a-d) move preferably perpendicular to the beam incidence, in particular periodically, and above all are irradiated chronologically one after the other.

12. Method according to Claim 10 or 11, characterized in that the reference beam is deflected laterally, preferably periodically, in order to impinge on the reflectors chronologically one after the other.

13. Method according to one of Claims 10 to 12, characterized in that the measurement beam is divided into beam parts which are focussed onto the areas (2a, 2b; 97a, 97b; 177a-d, 181a-d), the measurement beams preferably having a common optical axis.